

REMARKS/ARGUMENTS

Claims 1-16 are pending herein, claims 1, 8, 9 and 10 being independent. By the amendment above, claims 1, 3, 8-11 and 13 have been amended. Support for the amendments is shown in the listing beginning at page 8 of this paper. No new matter has been added.

The Examiner rejected claims 11 and 13 under 35 U.S.C. § 112(2d para.) as indefinite. the Examiner pointed out an antecedent basis problem arising from a prior amendment. By the amendment above, the claim term which referenced the missing antecedent element has been removed from claims 11 and 13, thereby removing any antecedent basis problem from those claims. Withdrawal of this rejection is therefore respectfully solicited.

The Examiner then rejected claims 1, 3-4, 6, 10-11 and 13-16 under 35 U.S.C. § 102(b) as allegedly anticipated by United States Patent No. 4,624,242 (McCall); claims 1-2, 6, 10-13 and 16 under 35 U.S.C. § 102(b) as allegedly anticipated by Figure 3 of United States Patent No. 4,080,703 (Beck, Jr.); claim 5 under 35 U.S.C. § 103(a) as allegedly obvious over McCall in view of 4,378, 626 (Eitel); and claims 7-9 under 35 U.S.C. § 103(a) as allegedly obvious over either Beck, Jr. or McCall in view of United States Patent No. 4,989,626 (Takagi, *et al.*). For the reasons set forth in detail below, it is respectfully submitted that the invention as now claimed is patentably distinct from either or both of McCall and/or Beck, Jr., either taken individually or in combination, or in combination with the other references applied by the Examiner.

The invention is directed to an improved heat sink for cooling a heat generating component. The invention includes a channel formed below a substantially planar surface of a heat sink base member, and a conduit disposed within the channel. As used herein, a "substantially planar surface" refers to a generally flat surface that is capable of interfacing with an entire heat transfer surface of a heat generating component (*e.g.* an IC, etc.). The conduit includes a flattened top portion which is

co-planar with the substantially planar surface. Thus, the flat surface of the conduit is configured to receive the heat generating component, and provide *direct thermal contact* between the heat generating element, *i.e.*, the component, and the element which holds the thermally conductive fluid which carries the heat away therefrom. This is nowhere shown, taught or suggested by the references applied by the Examiner.

McCall teaches a solar heat transfer and storage system in which adjacent conduits have flattened surfaces so that “there is a significantly increased area of mutual contact *between the two conduits*” (col. 7, lines 42-43) (emphasis added). These flat surfaces do not contact the heat generating element, but rather they contact adjacent conduits. Furthermore, McCall completely lacks the now-claimed feature of a conduit displaced beneath a substantially planar surface. Because the conduit in McCall is surrounded by a phase change material, such as paraffin 60 (col. 6, lines 4-8), there is simply no need for disposing the conduit beneath a substantially planar surface.

For all these reasons, McCall fails to teach or suggest, and in fact teaches away from, the heat sink as now recited in the amended claims.

Beck, Jr. teaches a solar panel having a metallic member 10 which has a sawtooth configuration 14 on its face, that will be exposed for either radiating or absorbing heat (col. 3, lines 14-16). The flat surface of the conduit 11b does not come into contact with the heat generating element. In fact, it is contemplated that this surface will be out of contact with any other element to allow for a bulging-out condition that may occur as a result of high pressure (col. 4, lines 18-25). Beck, Jr. further teaches that the heat transfer surface should not be planar so that the surface area of the heat transfer surface is increased (col. 3, lines 35-38).

Thus, neither McCall nor Beck, Jr. teaches a heat sink having an open-ended channel formed below a substantially planar first surface, with a fluid conduit disposed therein, having a

flattened, coplanar upper surface to thereby establish direct thermal contact between the heat generating component, the heat sink surface and the flattened upper surface of the fluid conduit, as is now set forth in the amended claims.

Accordingly, the invention as now claimed is patentably distinct from the two references, individually or in combination, upon which the Examiner primarily relies. The other references applied by the Examiner do not overcome the deficiencies of the primary references, and therefore fail to teach or suggest the claimed invention.

Takagi, *et al.* teach apparatus and method for controlling the opening and closing of a channel for liquid.

Eitel teaches a system having a heat sink, but the Eitel heat sink lacks the combination of a substantially planar heat sink base member and a fluid conduit having a flattened portion, to provide direct thermal contact with a heat generating component.

Thus, neither Takagi, *et al.* nor Eitel overcome the shortcomings of the primary references: McCall and Beck, Jr.

For all these reasons, therefore, the invention as now claimed is patentably distinct from the references applied by the Examiner in the pending Office Action.

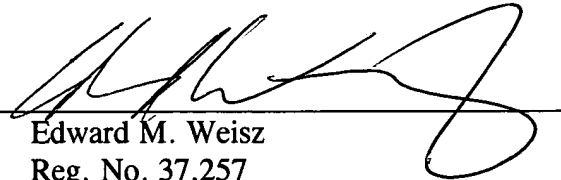
There being no further grounds for objection or rejection, early and favorable action is respectfully solicited.

It is believed that no fees or charges are required at this time in connection with the present application; however, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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By

A handwritten signature in dark ink, appearing to read 'Edward M. Weisz', is written over a horizontal line.

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